



**MINISTRY OF FORESTRY
FOREST DEPARTMENT, MYANMAR**



**AND
INTERNATIONAL TROPICAL TIMBER ORGANIZATION**

Project: PD 146/02 Rev.1 (I)
"Promoting Sustainable Utilization of Bamboo through Community
Participation in Sustainable Forest Management"

International Training Workshop
on
Small Bamboo Daily Product Processing Technologies and Machines



September 6 – 20, 2004
Zhejiang Province, China

The International Training Workshop
on
Small Bamboo Daily Product Processing Technologies and Machines

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Report on International Training Workshop on Small Bamboo Daily Product Processing Technologies and Machines

September 6 - 20, 2004
Zhejiang Province, China

by

Khin May Lwin

1. Introduction

Bamboo can be considered to be vital for the livelihood of the rural people which consist of 75% of Myanmar's population. At the same time it is also important for urban people as they also utilized bamboo greatly for the production of toothpick, chopstick, and other value added bamboo products. If bamboo is no used, there will be died by their limited age with no benefit. Before to reach this age, it should be used systematic and effective ways. In our country, we should try to produce quality and quantity bamboo products by using machines instead of traditional method to increase foreign income. A participant of Myanmar was sponsored by the International Tropical Timber Organization (ITTO) to attend the International Workshop organized by the China Ministry of Science and Technology (MOST), International Network for Bamboo and Rattan (INBAR) and The International Farm Forestry Training Center (INFORTRACE). That why, I attended to international training workshop on small bamboo daily product processing technologies and machines at Zhejiang Province, China in September 6th - 20th, 2004.

2. Objective

To study the production technique of small bamboo daily products and the performance of the related machines.

To enhance the technologies exchange in related fields among developing countries and improve the bamboo development and ecological environment of these countries.

3. Participants

21 participants from 13 countries, namely, Colombia, Ecuador, Ethiopia, India, Indonesia, Ghana, The Philippines, Mexico, Myanmar, Nigeria, Tanzania and Uganda attended the training workshop.

4. Duration

The training workshop started on the 6th of September 2004 and finished on the 20th of September, 2004. It covers duration of 15 days.

5. Location

The training workshop was held at Zhejiang Province, China.

6. Workshop Organizers

The training workshop was jointly organized by the China Ministry of Science and Technology (MOST), International Network for Bamboo and Rattan (INBAR) and the International Farm Forestry Training Center (INFORTFACE).

7. Contents and Discussions of Workshop

Lecture Programme consisted of:

7.1. A General Introduction to the bamboo Development in China by Prof. Zhu Zhaohua.

In this general introduction, Prof. Zhu Zhaohua explained about the experience that China has on bamboo resources and the research on bamboo's taxonomy and flora; disease and pest control; fundamental studies on bamboo's ecology, physiology and anatomy; high yielding techniques; bamboo shoot processing technology; the extract of bamboo leaves and their utilization; and bamboo processing machines. He also stressed on the extension of bamboo technologies, policies and management system that enhance the development of the bamboo sector which help to increase the income of local farmers, improves the rural environment and the sustainable development of the economy.

7.2. Lecture on Production Process & Equipment for Bamboo Daily Products by Liu Zhikun, Zhejiang Forestry College

The lecture focused on the detail production process and equipment for bamboo daily products such as chopstick, toothpick, skewers, curtain, mah-jong mat (Domino mat).

7.3. Lecture on bamboo based panels processing technologies by Prof. Zhang Qisheng, bamboo Engineering Centre of Nanjing Forestry University.

The lecture focused on the bamboo parquet processing Technology.

7.4. Lecture on bamboo shoot processing technologies, boiled shoot processing machine and general Calculation of the investment by Dr. Ma Lingfei, Zhejiang Forestry University

This lecture gave information on the species and distribution of edible bamboo shoots, chemical content of bamboo shoot and bamboo processing technologies for boiled shoot, oil stewed shoot and tianmu dried shoots.

7.5. Lecture on bamboo charcoal and vinegar production technologies and utilization by Dr. Zhang Wenbiao, Zhejiang Forestry University

The lecture expressed bamboo pyrolysis technology, the processing technology of bamboo vinegar and the utilization of bamboo charcoal and vinegar.

7.6. Lecture on sustainable forest development in Lin'an by Mr. Wang Angno, Chief Engineer, Lin'an Forestry Bureau

The lecture concentrated on the review of sustainable development in the Lin'an forest industry, their main experiences and their ideology and goals for sustainable development in Lin'an in the new century.

7.7. Lecture on the Impact Assessment of Bamboo Shoot on Poverty Reduction in Lin'an, China by Prof. Zhu Zhaohua.

The Lecture consisted of assessment activities and approaches, basic information about Lin'an, the bamboo shoot development project in Lin'an, how Lin'an develops its bamboo shoot industry. It also assessed the direct and indirect impact of bamboo shoot development on poverty reduction and the opportunities and challenges facing the Lin'an bamboo shoot sector.

7.8. Lecture on bamboo industry's Impact Evaluation on Rural Sustainable Development in Anji County, China by Prof. Zhu Zhaohua and the Director of the Anji Forestry Bureau.

In this lecture, Prof. Zhu Zhaohua explained about the evaluation activities and approaches, basic information of Anji, development of Anji bamboo industry, bamboo industry's impact on rural development, and experience in the development of Anji bamboo industry and the opportunities and challenges co-existing in bamboo industry development.

8. Practical works and field trips

8.1. Yihua Food Co. Ltd.

In this factory, processing technique of small packs of bamboo shoot pickles was studied.

8.2. Hang Zhou Kangxin Bamboo Food Co. Ltd.

Boiled shoot processing technology was observed in detail.

8.3. Hang Zhou Bamfox Bamboo Products Co. Ltd.

Bamboo floor processing technologies were observed.

8.4. Toothpick, barbecue skewer factory and bamboo gardening pole factory.

Received practical training on raw cutting, splitting, fixed width stripping and node removing, slicing (shaping), boiling, drying, cutting, polishing, sharpening, inspecting and packing.

8.5. Bamboo charcoal kiln of Hang Zhou Bamfox bamboo Product Co. Ltd.

Observed bamboo charcoal making by brick charcoal kiln.

8.6. Bamboo curtain factory.

Received practical training on raw cutting, splitting, fixed width stripping and node removing, slicing (shaping), boiling, drying, weaving, pressing and coating, edge sealing, packing and finishing.

8.7. Bamboo processing machine manufacture.

Observed different kinds of machines for making of Bamboo curtain, Bamboo flooring, Toothpick, barbecue skewer and bamboo gardening pole process making.

8.8. Anji Chunhui Bamboo and Wood Product Co. Ltd.

Observed bamboo handicraft and toy making by using machines.

8.9. Bamboo mold board factory.

Observed bamboo mold board making with bamboo strips and phenol formaldehyde glue.

8.10. Bamboo fiber board factory.

Observed bamboo fiber board making by using bamboo waste and glue.

8.11. Visits to eco-tour Baisha village, bamboo eco-tour Baishuijian, Anji bamboo museum, Anji Bamboo Arboretum, West Lake and silk city of Hang Zhou were also organized.

9. Participant presentation

For the exchange knowledge programme, 10 papers were presented by the participants from the 10 countries that attended the training workshop. The author presented a paper titled "Current Status and Prospect of bamboo Industries in Myanmar".

9.1. List of participants and the title of their presentations

No.	Country	Name	Title
1	Ethiopia	Melaku Tadesse Gebresellasi	Promotion of Bamboo Development and Marketing in Ethiopia
2	Ethiopia	Fiker Assefa	Utilization of bamboo in Ethiopia
3	Philippines	Alfredo R. Rabena	Common Bamboo Species in tropical Philippines, their silviculture and utilization
4	Myanmar	Khin May Lwin	The current status and prospects of bamboo industries in Myanmar
5	Indonesia	Sentot Subagyo	The Current Status of Bamboo Plantations in Indonesia: Some Prospectious Issues for Business Development
6	Colombia	Julian Ospina	Colguadua
7	Ethiopia	Tesfaye Hunde Gurmu	Bamboo Resource Status in Ethiopia
8	Ecuador	Juan Pablo Arteaga	Natural Guadua CNOP Management
9	India	M. A. Khan	Tripura Report
10	Nigeria	A. A. Ogunwusi	Bamboo Development and Utilization on Nigeria

10. Observation

Bamboo development was initiated in the Republic of China since 1980 and the country is now enjoying the benefits received from bamboo. It was noticed that China is getting a very high income from bamboo, and this has changed the life style of those working with bamboo. The success was mainly due to the good cooperation among those working in the bamboo sector. Much knowledge on bamboo development and their ecological environment was gained by the trainees through this training workshop and through the interaction among the participants themselves.

The participants are now quite well acquainted with the technology on the production and processing of toothpick, chopstick, garden stick, bamboo parquet, bamboo shoot, charcoal, curtain, mat, and the machineries need for their production. Step by step development of China's bamboo sector is acknowledgeable and was appreciated by all the participants. It was generally accepted by all the participants that the development of bamboo sector can help to

increase the income of the local farmers and improve the rural environment and ensure the sustainable development of the country's economy.

11. Recommendations

Myanmar has abundant natural bamboo resources. They are mainly sympodial type of bamboo and it is therefore recommended that:

- means and ways of effective utilization of bamboo products with production based on our own bamboo species should be identified,
- design of the Chinese bamboo product production machines should be modified to suit our own bamboo species,
- bamboo shoot and other bamboo products processing technologies should be improved based on our own bamboo species so as to earn more foreign exchange through bamboo products export,
- more research on bamboo propagation, utilization and marketing should be carried out.
- bamboo industry such as "bamboo curtain" production, which is not yet developed in Myanmar should be promoted. This product is one of the successful export products in China,
- bamboo technologies and the importance of bamboo should be extended to the local people,
- linkage with International bamboo market should be made all the time.

12. Conclusions

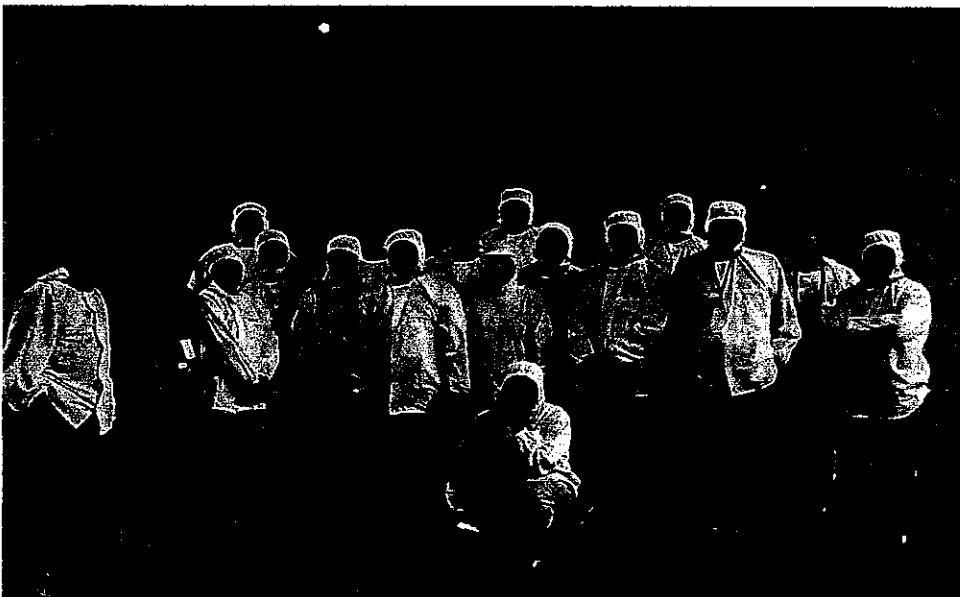
Myanmar needs to change the traditional production processing of bamboo products to high quality and quantity bamboo products production by machines. This should be initiated so as to increase the foreign exchange income through bamboo products. Much knowledge on processing and machine of bamboo shoot, bamboo charcoal, toothpick, curtains, mats, bamboo boards, daily handicraft and so on were gained from this training workshop. Opportunities to practice on the machines in factories so as to get familiar with the processing techniques and machines were also got.

I would like to extend my appreciation to the International Network for Bamboo and rattan (INBAR), the International Farm Forestry Training Centre (INFOTRACE) of the Chinese Academy of Forestry (CAF) and Ministry of Science and Technology of China (MOST). I also want to thank ITTO Project for supporting fund for me to participate in this training workshop.

13. Annex

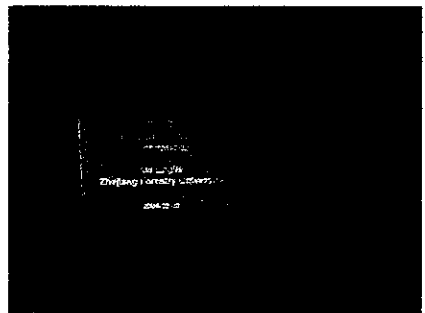
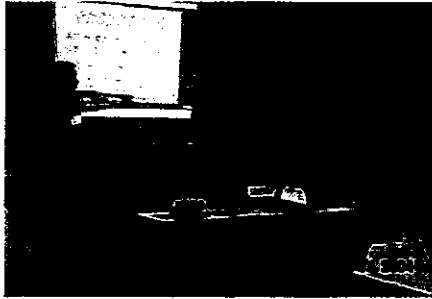
13.1. Workshop photographs

Participants of the workshop



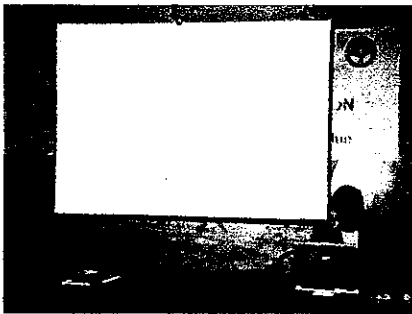
The workshop was attended by 21 participants

Lecture Programme



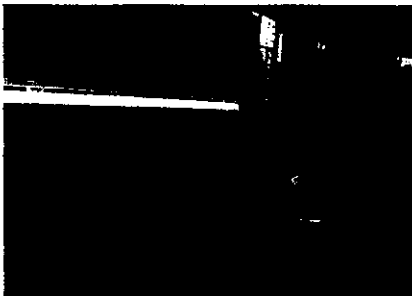
Participants presentation

Certificate award



Practical works

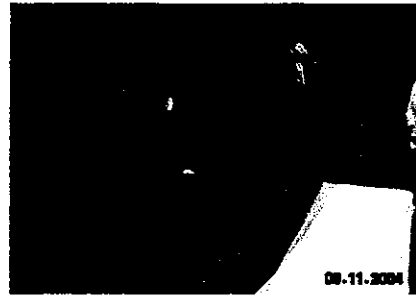
Discussion



Studies in the related factories



Hangzhou Kangxin foods Co. Ltd



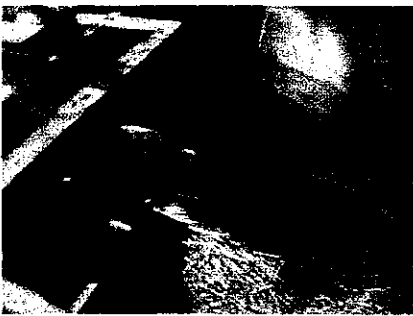
Hangzhou Bamfox Bamboo products Co. Ltd.



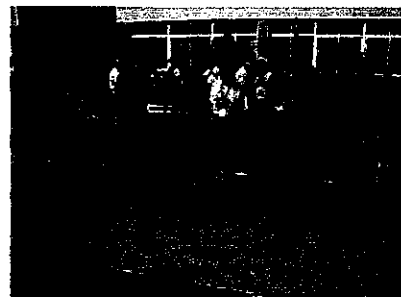
Bamboo Charcoal Kiln of Hangzhou Bamfox Bamboo products Co. Ltd.



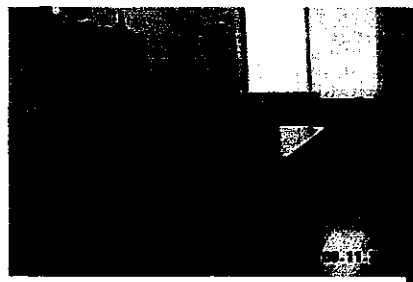
Bamboo mat board samples



Bamboo toothpick factories



Bamboo processing machine manufacture

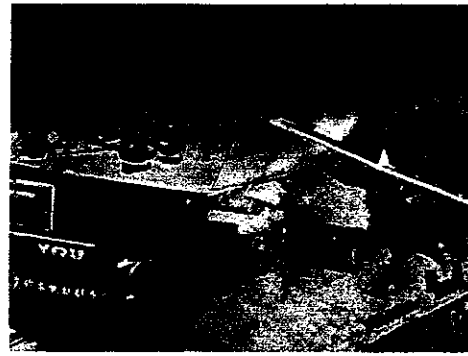


China bamboo products

Bamboo curtain processing



Raw cutting



Splitting



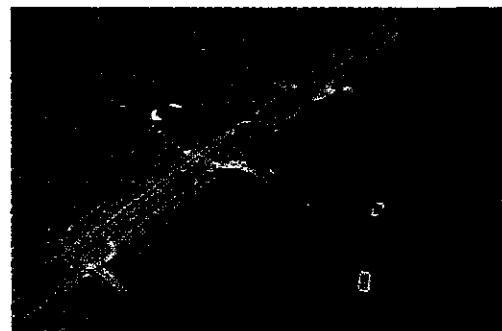
Split bamboo



Waving



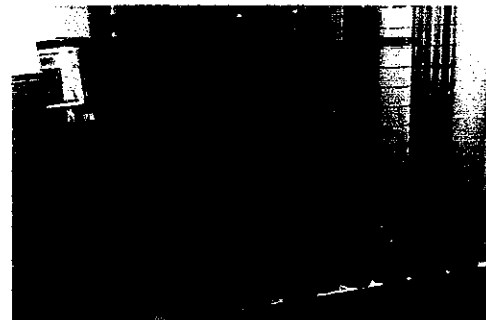
Inspection



Finishing



Packaging

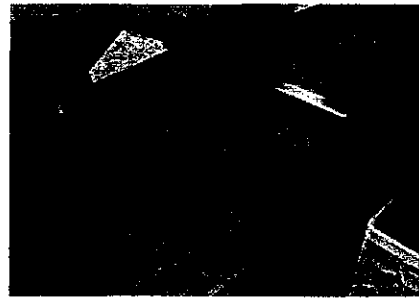


Beautiful bamboo curtains

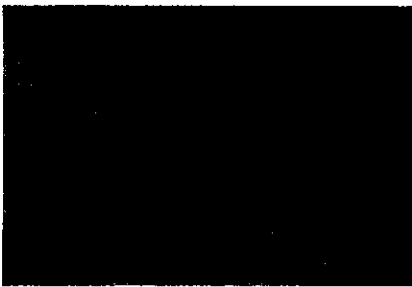
Bamboo shoot processing



Cutting



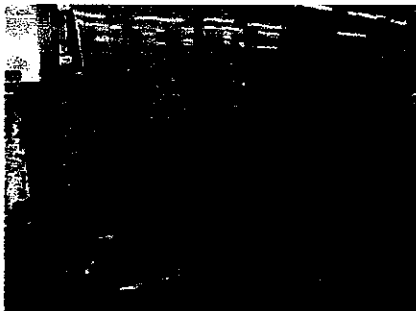
Washing



Boiling



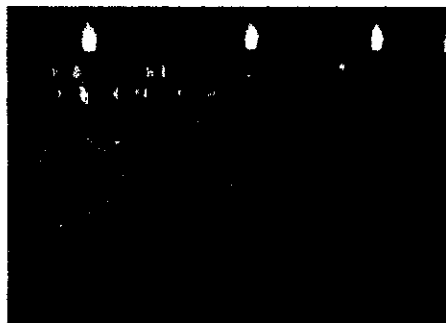
Inspecting



Packaging machine



After packaging



Cool storage

13. Annex

13.2. List of Participants

International Training Workshop on Small Bamboo Daily Product Processing Technologies and Machines, September 6-20, 2004, Zhejiang, China

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13.3. Agenda

International Training Workshop on Small Bamboo Daily Product Processing Technologies and Machines, September 6-20, 2004, Zhejiang, P. R. China

September 6

Registration

Indoor courses

September 7

- 8:30-9:30 Opening Ceremony (Hangzhou)
9:30-10:00 Tea break
10:00-11:30 China bamboo development and its main experiences – Prof. Zhu Zhaohua
11:30-12:00 Discussion
- 12:00-13:30 Lunch
- 13:30-15:00 Bamboo panel processing technologies – Prof. Zhang Qisheng, Academician of Chinese Academy of Engineering, Bamboo Engineering Center of Nanjing Forestry University
15:00-15:20 Tea break
15:20-16:15 Sustainable development of Lin'an bamboo shoot industry – Prof. Zhu Zhaohua
16:15-16:30 Tea break
16:30-17:30 Sustainable management of forestry in Lin'an – Mr. Wang Anguo, Chief Engineer, Lin'an Forestry Bureau

September 8

- 8:00-9:30 Bamboo floor and molding board processing machines and a general calculations of the investment – Mr. Chen Qidong, Hangzhou Bambox Bamboo Products Co. Ltd.
9:30-10:00 Tea break
10:00-11:30 Bamboo shoot processing technologies, boiled shoot processing machines and a general calculation of the investment – Dr. Ma Lingfei, Zhejiang Forestry University
12:00-13:30 Lunch

- 13:30-15:00 Bamboo curtain (including bamboo carpet) and bamboo matting processing, machines and a general calculation of the investment
- 15:00-15:30 Tea break
- 15:30-16:30 Bamboo stick (toothpick, barbecue skewer) processing, machines and general calculation of the investment - Prof. Liu Zhikun, Zhejiang Forestry University
- 16:30-17:00 Bamboo mat (mahjong mat) processing, machines and a general calculation of the investment

Field practice

September 9

- 8:00 – 10:00 Visit to Yihua Food Co. Ltd. – processing techniques of small packs of bamboo shoot pickles
- 10:00-12:00 Visit to Hangzhou Kangxin Bamboo Food Co. Ltd. – boiled shoot processing technologies
- 12:00 – 13:30 Lunch
- 13:30-17:00 Visit to Hangzhou Baifu Bamboo Products Co. Ltd. – bamboo floor processing technologies

September 10

- 8:00-12:00 Practice on bamboo stick (toothpick, barbecue skewers) processing
- 12:00-13:00 Lunch
- 13:00 – 17:00 Practice on bamboo stick (toothpick, barbecue skewers) processing

Indoor course

September 11

- 8:00 – 10:00 Bamboo charcoal and bamboo vinegar processing technologies and utilization – Dr. Zhang Wenbiao, Zhejiang Forestry University
- 10:00-10:20 Tea break
- 10:20-12:00 How to identify regional bamboo development strategy – with emphasis on poor bamboo development regions, based on the experiences of Ecuador and Hainan, China – Prof. Zhu Zhaohua
- 12:00-13:30 Lunch

Field practice

13:30-17:30 Practice on bamboo charcoal processing

September 12

8:00-12:00 Practice on bamboo curtain processing techniques (initial processes) and bamboo flooring lath processing techniques

12:00-13:30 Lunch

13:30-17:00 Practice on bamboo curtain processing techniques (initial processes) and bamboo flooring lath processing techniques

Participant presentation

September 13

8:00 – 10:00 Participant presentations

10:00-10:15 Tea break

10:15-11:30 Other courses if necessary: Sympodial bamboo propagation and management technologies – Prof. Zhu Zhaohua

12:00-13:30 Lunch

Discussion

13:30-17:30 Discussion among participants, representatives from local companies and technicians, discussion topics are: 1) Implementation of the company + farmer management model in the bamboo development; 2) How to improve the comprehensive utilization rate of bamboo during processing; 3) Bamboo product marketing; 4) Governments' role in bamboo development.

September 14

Bamboo eco-tour

8:00-11:00 Bamboo eco-tour – Baishuijian

12:00-13:30 Lunch

13:30-14:30 Introduction to the eco-village – Baisha Village

14:30-16:00 Visit to Baisha Village

16:00-17:30 Travel from Baisha to Anji

Stay in Anji

September 15

8:00-9:30 Introduction to the bamboo development in Anji County – Prof. Zhu Zhaohua and the Director of the Anji Forestry Bureau

9:30-11:30 Visit to Anji bamboo museum and Anji Bamboo Arboretum

12:00-13:30 Lunch

Field Practice

13:30-17:30 Practice on bamboo curtain processing technologies

September 16

8:00-11:30 Practice on bamboo curtain processing technologies

12:00-13:30 Lunch

13:30-17:30 Practice on bamboo mahjong mat processing technologies

September 17

8:00-10:00 Practice on bamboo concrete mold board processing technologies

10:00-12:00 Practice on bamboo fibre board processing technologies

12:00-13:30 Lunch

13:30-15:30 Visit and practice on bamboo gardening pole processing in bamboo gardening product factory

15:30-17:30 Visit to bamboo processing machine manufacturer

September 18

8:00-11:30 Visit to Anji Chunhui Bamboo and Wood Product Co. Ltd. (small daily bamboo products)

11:30-13:00 Lunch

Conclusion and Evaluation

13:00-17:30 Workshop conclusion and evaluation

September 19

8:00-9:30 Travel from Anji to Hangzhou

9:30-12:00 Visit to the silk city of Hangzhou

12:00-13:00 Lunch

13:00-16:00 Touring on the West Lake

16:00-19:00 Shopping

September 20

Departure